## Claims

1. A method for providing biomolecules on a metal oxide substrate comprising the steps of:

a) coating said substrate with a polymer by bringing said substrate into contact with a solution comprising said polymer such that the polymer in said solution is able to form a coating on a surface of said substrate,

b) deposing said biomolecules onto the substrate obtained in step a) by bringing said biomolecules into contact with said substrate, and

c) immobilizing said biomolecules onto the substrate obtained in step a) by covalently binding said biomolecules to said substrate by means of electromagnetic irradiation.

2. A method according to claim 1, wherein said polymer is substantially adsorptively bound on the metal oxide substrate.

3. A method according to claim 1 or 2, wherein said polymer comprises multiple amide functional groups and/or multiple cationic functional groups.

4. A method according to any of claims 1 to 3, wherein said polymer is selected from the group comprising poly-aspartate, poly-glutamate, poly-cysteine, poly-serine, poly-methionine, poly-arginine, poly-histidine, poly-tryptophane, poly-alanine, poly-lysine, poly-leucine, poly-isoleucine, poly-tyrosine, poly-valine, poly-glycine, poly-proline, poly-phenylalanine, poly-threonine, polymers of other natural and non-natural amino acids and derivatives and mixtures thereof.

5. A method according to claim 4 wherein said polymer is poly-L-lysine.

6. A method according to any of claims 1 to 5, wherein said metal oxide substrate is a porous metal oxide substrate.

7. A method according to any of claims 1 to 6, wherein said metal oxide substrate is a substrate having oriented through-going channels.

8. A method according to any of claims 1 to 7, wherein said metal oxide substrate is an aluminium oxide substrate.

9. A method according to any of claims 1 to 8, wherein the biomolecules are immobilized on the substrate in spots, thereby forming an array of spots.

10. A method according to any of claims 1 to 9, wherein said biomolecules comprise the same or different biomolecules.

11. A method according to any of claims 1 to 10 wherein said biomolecules are selected from the group comprising oligonucleotides, polynucleotides, ribonucleotides, proteins, antibodies, antigens, peptides, oligo or poly saccharides, receptors, haptens, ligands, antibodies, antigens, peptides, oligo or poly saccharides, receptors, haptens and ligands, drugs, toxins and liposomes.

12. A metal oxide substrate obtainable according to the method of any of claims 1 to 11, having a surface that is coated with a polymer said substrate having biomolecules immobilised thereon, wherein said biomolecules are immobilised on said substrate by covalent binding by means of electromagnetic irradiation.

13. A metal oxide substrate according to claim 12, wherein said metal oxide substrate is a porous aluminium oxide substrate, having oriented through-going channels.

14. A metal oxide substrate, having a surface that is coated with a polymer, said substrate having biomolecules immobilised thereon, wherein said biomolecules are immobilised on said substrate by covalent binding by means of electromagnetic irradiation.

15. A metal oxide substrate according to claim 14, wherein said metal oxide substrate has a surface that is coated with a polypeptide, and preferably with poly-L-lysine.

16. A metal oxide substrate according to claim 14 or 15, wherein said metal oxide substrate is a porous aluminium oxide substrate, having oriented through-going channels.

17. An aluminium oxide substrate, having a surface that is coated with a polymer, said substrate having biomolecules immobilised thereon, wherein said biomolecules are immobilised on said substrate by covalent binding by means of electromagnetic irradiation.

18. An aluminium oxide substrate according to claim 17, wherein said substrate has a surface that is coated with a polypeptide, and preferably with poly-L-lysine.

19. An aluminium oxide substrate according to claim 17 or 18, wherein said substrate is a porous aluminium oxide substrate having oriented through-going channels.

20. A kit or parts of a kit comprising a metal oxide substrate according to any of claims 12 to 19, further comprising a detection means for determining whether binding has occurred between biomolecules and an analyte.

21. A kit according to claim 20, wherein the detection means is a substance capable of binding to the analyte and being provided with a label.

22. A kit according to claim 21, wherein the label is capable of inducing a colour reaction and/or capable of bio-, chemi- or photoluminescence.

23. Method for performing probe-based assays, comprising the steps of:

contacting a sample comprising an analyte to a metal oxide substrate having biomolecules immobilised thereon according to any of claims 12 to 19;

incubating said sample with said substrate under conditions suitable for allowing binding of said analyte in said sample to said biomolecules immobilised on said substrate; and

detecting the binding of said analyte in said sample to said biomolecule immobilised on said substrate.

24. Use of a metal oxide substrate according to any of claims 12 to 19 for performing probe-based assays.